Thomas Nash/R5/USEPA/US @EPA
04/11/2002 03:35 PM

To: "McWilliams, Douglas" <DMcWilliams@ssd.com>
cc:
Subject: RE: CRS Site AOC

Doug:

I'm attaching a revision of the SOW from which I think I managed to remove all redline/strikeout. Please let me know if I missed anything. I remember you mentioned some instance of inconsistent fonts (in the AOC?). Please let me know where such blemishes occur. Let me know if anything else remains to do before you circulate the AOC for signatures by your group members.

Thanks, Tom

(See attached file: LASTCRSSOW.wpd)

(c) Thomas C. Nash
Associate Regional Counsel
phone: 312-886-0552
fax: 312-886-7160 or 312-886-0747
email: nash.thomas@epa.gov

LASTCRSSOW.wpd

STATEMENT OF WORK
FOR PRP-CONDUCTED
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
AT
CHEMICAL RECOVERY SYSTEMS INC.
ELYRIA, OHIO

The purpose of this remedial investigation/feasibility study (RI/FS) is to investigate the nature and extent of contamination for the Chemical Recovery Systems Superfund Site (Site), as generally described at paragraph 2, Section I of the Administrative Order by Consent (AOC) and develop and evaluate potential remedial alternatives. The RI and FS are interactive and will be conducted concurrently so that the data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and the scope of treatability studies, if needed.

The Respondents will conduct this RI/FS and will produce draft and final RI/FS reports that are in accordance with this statement of work (SOW), the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (U.S. EPA, Office of Emergency and Remedial Response, October 1988) (RI/FS Guidance), and any other guidance that U.S. EPA uses in conducting a RI/FS (a list of the primary guidance documents is attached), as well as any additional requirements in the Administrative Order on Consent. The RI/FS Guidance describes the report format and the required report content. Numerical reference to the appropriate section of the RI/FS Guidance will be found following the Section headings throughout this SOW. The Respondents will furnish all necessary personnel, materials, and services needed, or incidental to, performing the RI/FS, except as otherwise specified in the administrative order.

The Respondents will provide U.S. EPA and Ohio EPA with a copy of all deliverables or documents required as part of this statement of work for approval. U.S. EPA, after consultation with the Ohio EPA, will be responsible for the selection of a Site remedy and will document this selection in a Record of Decision (ROD). The remedial action alternative selected by U.S. EPA will meet the cleanup standards specified in CERCLA Section 121. These standards require, in part, that the selected remedial action will be protective of human health and the environment, will be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements of other laws, will be cost-effective, will utilize permanent solutions

and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and will address the statutory preference for treatment as a principal element. The final RI/FS report and the baseline risk assessment, as adopted by U.S. EPA, will, with the administrative record, form the basis for the selection of the Site's remedy and will provide the information necessary to support the development of the ROD.

As specified in CERCLA Section 104(a)(1), as amended by SARA, U.S. EPA and Ohio EPA will provide oversight of the Respondent's activities throughout the RI/FS, including all field sampling activities. U.S. EPA may delegate oversight tasks to Ohio EPA or other delegates rather than performing the same tasks with U.S. EPA personnel. The Respondents will support U.S. EPA's, or its delegates' initiation and conduct of activities related to the implementation of oversight activities.

All correspondence, communication, and submittals from Respondents shall be directed to the following and additional individuals identified by these agencies:

Gwendolyn Massenburg
Remedial Project Manager
United States Environmental Protection Agency
77 West Jackson Blvd., Mailcode SR-6J
Chicago, Illinois 60604-3590
Phone: 312-886-0983
FAX: 312-886-4071
Email "Massenburg.Gwendolyn@epa.gov"

Thomas C. Nash
Associate Regional Counsel
United States Environmental Protection Agency
77 West Jackson Blvd., Mailcode C-14J
Chicago, Illinois 60604-3590
Phone: 312-886-0552
FAX: 312-886-7160
Email nash.thomas@epa.gov

Lawrence Antonelli
Ohio Environmental Protection Agency
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087
Phone 330-963-1127
FAX: 330-487-0769
Email "larry.antonelli@epa.state.oh.us"

All correspondence and communication from U.S. EPA or Ohio EPA shall be directed to the following and additional individuals identified by Respondents:

Douglas McWilliams
Squire, Sanders & Dempsey, L.L.P.
4900 Key Tower
127 Public Square
Cleveland, Ohio 44114-1304
Phone: 216-479-8332
FAX: 216-479-8776
Email: dmcwilliams@ssd.com

Peter Gelman
Parsons, Inc.
19101 Villaview Road, Suite 100
Cleveland, Ohio 44119
Phone: 216-486-9005
FAX: 216-486-6119
Email: Peter.Gelman@parsons.com

TASK 1 - SCOPING (RI/FS Guidance, Chapter 2)

Scoping is the initial planning process of the RI/FS and is initiated by U.S. EPA prior to issuing special notice. During this time, the Site-specific objectives of the RI/FS, including the preliminary remediation goals (PRGs), are determined by U.S. EPA. Scoping is therefore initiated prior to negotiations between the PRPs and U.S. EPA, and is continued, repeated as necessary, and refined throughout the RI/FS process. In addition to developing the Site-specific objectives of the RI/FS, U.S. EPA will determine a general management approach for the Site.

Consistent with the general management approach, the specific project scope will be planned by the Respondents and U.S. EPA. The Respondents will document the specific project scope in a Work Plan. Because the work required to perform a RI/FS is not fully known at the onset, and is phased in accordance with a site's complexity and the amount of available information, it may be necessary to modify the Work Plan during the RI/FS to satisfy the objectives of the study.

The preliminary objectives for the remedial action at the Site, based on currently available information, are:

- Prevention or abatement of actual or potential exposure to

nearby human populations, animals, or the food chain from hazardous substances pollutants or contaminants;

- Prevention or abatement of actual or potential contamination of drinking water supplies or sensitive ecosystems;

- Treatment or elimination of high levels of hazardous substances, pollutants, or contaminants in soils or sediments largely at or near the surface that may migrate;

- Mitigation or abatement of other situations or factors that may pose threats to public health, welfare, or the environment.

The strategy for achieving the remedial objectives and for the general management of the Site will include the following: Respondents shall:

a. conduct a remedial investigation to determine fully the nature and extent of the release or threatened release of hazardous substances, pollutants, or contaminants from the Site. In the performance of this investigation, Respondents shall gather sufficient data, samples, and other information, to fully characterize the nature and extent of contamination at the facility and to support the performance of human health and ecological risk assessments for this Site.

b. Perform a feasibility study to identify and evaluate alternatives for the appropriate extent of remedial action to prevent or mitigate the migration or the release or threatened release of hazardous substances, pollutants, or contaminants from the Site. In developing alternatives for remedial action, Respondents may consider:

   1. Potential future land use scenarios;

   2. Relevant and appropriate presumptive remedies;

   3. Cost-effective, proven technologies;

   4. Enhancements of natural processes, and/or

   5. Use of appropriate institutional controls;

c. If the Remedial Investigation reveals contamination in specific, identifiable areas of concern which may present an imminent and substantial endangerment of human health or the

environment, Respondents may propose or U.S. EPA may require an interim response action to address the threat identified. Respondents may propose, subject to U.S. EPA review, comment and approval, with modifications if necessary, interim response actions that, if implemented, will protect human health and the environment and may contribute to the effectiveness of the remedial action eventually selected for this Site.

When scoping the specific aspects of a project, the Respondents will meet with U.S. EPA to discuss all project planning decisions and special concerns associated with the Site. The following activities shall be performed by the Respondents as a function of the project planning process.

Site Background (2.2)

The Respondents will gather and analyze the existing Site background information and will conduct a Site visit to assist in planning the scope of the RI/FS.

Collect and analyze existing data and document the need for additional data (2.2.2; 2.2.6; 2.2.7)

Before planning RI/FS activities, all existing Site data will be thoroughly compiled and reviewed by the Respondents. Specifically, this will include presently available data relating to the varieties and quantities of hazardous substances at the Site, and past disposal practices. This will also include results from any previous sampling events that may have been conducted. The Respondents will refer to Table 2-1 of the RI/FS Guidance for a comprehensive list of data collection information sources. This information will be utilized in determining additional data needed to characterize the Site, better define potential applicable or relevant and appropriate requirements (ARARs), and develop a range of preliminarily identified remedial alternatives. Data Quality Objectives (DQOs) will be established subject to U.S. EPA approval which specify the usefulness of existing data. Decisions on the necessary data and DQOs will be made by U.S. EPA.

Conduct Site Visit

The Respondents will visit the Site during the project scoping phase to develop a better understanding of the Site, focusing on sources and areas of contamination as well as related potential exposure pathways and receptors at the

Site. During the Site visit, the Respondents will observe, to the extent possible, the Site's physiography, hydrology, geology, and demographics, as well as natural resource, ecological and cultural features. This information will be utilized to better scope the project and to determine the extent of additional data necessary to characterize the Site, better define potential ARARs, and narrow the range of preliminarily identified remedial alternatives.

Project Planning (2.2)

Once the Respondents have collected and analyzed existing data and conducted a Site visit, the specific project scope will be planned. Project planning activities include those tasks described below as well as identifying data needs, developing a Work Plan, designing a data collection program, and identifying health and safety protocols. These tasks are described in Section c. of this Task since they may result in the development of specific required deliverables.

Refine and document preliminary remedial action objectives and alternatives (2.2.3)

Once existing Site information has been analyzed and an understanding of the potential Site risks has been determined by Respondents and U.S. EPA, the Respondents will review and, if necessary, refine the remedial action objectives that have been identified by U.S. EPA for each actually or potentially contaminated medium. The revised remedial action objectives will be documented in a technical memorandum and are subject to U.S. EPA approval. The Respondents will then identify a preliminary range of broadly defined potential remedial action alternatives and associated technologies relevant to the Site characteristics. The range of potential alternatives will encompass, where appropriate, alternatives in which treatment significantly reduces the toxicity, mobility, or volume of the waste; alternatives that involve containment with little or no treatment; and a no-action alternative.

Document the need for treatability studies (2.2.4)

If remedial actions involving treatment have been identified by the Respondents or U.S. EPA, treatability studies will be required except where the Respondents can demonstrate to U.S. EPA's satisfaction that they are not needed. Where treatability studies are needed, initial treatability testing activities (such as research and study design) will

be planned to occur concurrently with Site characterization activities (see Tasks 3 and 5).

Begin preliminary identification of Potential ARARs (2.2.5)

The Respondents will conduct a preliminary identification of potential state and federal ARARs (chemical-specific, location-specific and action-specific) to assist in the refinement of remedial action objectives, and the initial identification of remedial alternatives and ARARs associated with particular actions. ARAR identification will continue as Site conditions, contaminants, and remedial action alternatives are better defined.

Scoping Deliverables (2.3)

At the conclusion of the project planning phase, the Respondents will submit a RI/FS Work Plan, a Sampling and Analysis Plan, and a Site Health and Safety Plan. The RI/FS Work Plan and Sampling and Analysis Plan will be reviewed and approved by U.S. EPA prior to the initiation of field activities.

RI/FS Work Plan (2.3.1)

A Work Plan documenting the decisions and evaluations completed during the scoping process will be submitted to U.S. EPA and Ohio EPA for review and to U.S. EPA for review, comment and approval. The Work Plan will be developed in conjunction with the Sampling and Analysis Plan and the Site Health and Safety Plan, although each plan may be delivered under separate cover. The Work Plan will include a comprehensive description of the work to be performed, including the methodologies to be utilized, as well as a corresponding schedule for completion. In addition, the Work Plan will include the rationale for performing the required activities. Specifically, the Work Plan will present a statement of the problem(s) and potential problem(s) posed by the Site and the objectives of the RI/FS. Furthermore, the Work Plan will include a Site background summary setting forth the Site description including the geographic location of the Site, and to the extent possible, a description of the Site's physiography, hydrology, geology, demographics, ecological, cultural and natural resource features; a synopsis of the Site history and a description of previous responses that have been conducted at the Site by local, state, federal, or private parties; a summary of the existing data in terms of physical

and chemical characteristics of the contaminants identified, and their distribution among the environmental media at the Site. The Work Plan will recognize Respondent's preparation of the baseline human health and ecological risk assessment. In addition, the Work Plan will include a description of the Site management strategy developed by U.S. EPA during scoping; a preliminary identification of remedial alternatives and data needs for evaluation of remedial alternatives. The Work Plan will reflect coordination with treatability study requirements, if any, (see Tasks 1 and 4). It will also include a process for and manner of identifying Federal and State ARARs (chemical-specific, location-specific and action-specific).

Finally, the major part of the Work Plan will be a detailed description of the tasks to be performed, information needed for each task and for the baseline human health and ecological risk assessment, information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to U.S. EPA and Ohio EPA. This includes the deliverables set forth in the remainder of this SOW; a schedule for each of the required activities which is consistent with the RI/FS guidance; and a project management plan, including a data management plan (e.g., requirements for project management systems and software, minimum data requirements, data format and backup data management), monthly reports to U.S. EPA and Ohio EPA and meetings and presentations to U.S. EPA and Ohio EPA at the conclusion of each major phase of the RI/FS. The Respondents will refer to Appendix B of the RI/FS Guidance for a comprehensive description of the contents of the required Work Plan. The RI/FS Work Plan will also require the Respondents to gather sufficient data, samples and other information, to fully characterize the nature and extent of contamination at the facility. Because of the unknown nature of the Site and iterative nature of the RI/FS, additional data requirements and analyses may be identified throughout the process. The Respondents will submit a technical memorandum documenting the need for additional data, and identifying the DQOs whenever such requirements are identified. In any event, the Respondents are responsible for fulfilling additional data and analysis needs identified by U.S. EPA and Ohio EPA consistent with the general scope and objectives of this RI/FS.

Sampling and Analysis Plan (2.3.2)

The Respondents will prepare a Sampling and Analysis Plan

(SAP) to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data meet DQOs. The SAP provides a mechanism for planning field activities and consists of a Field Sampling Plan (FSP) and a quality assurance project plan (QAPP).

The FSP will define in detail the sampling and data-gathering methods that will be used on the project. It will include sampling objectives, sample location and frequency, sampling equipment and procedures, and sample handling and analysis. Respondents will include a schedule which identifies the timing for the initiation and completion of all tasks to be completed as a part of this FSP.

The QAPP will be prepared in accordance with "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" (EPA/240/B-01/003, March 2001) and "EPA Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/600/R-98/018, February 1998). The QAPP will describe the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols that will be used to achieve the desired DQOs. The DQOs will at a minimum reflect use of analytic methods to identify contamination and remediate contamination consistent with the levels for remedial action objectives identified in the National Contingency Plan, 40 C.F.R. Part 300. In addition, the QAPP will address sampling procedures, sample custody, analytical procedures, and data reduction, validation, reporting and personnel qualifications. Respondents will also ensure provision of analytical tracking information consistent with the U.S. EPA's Office of Solid Waste and Emergency Response (OSWER) Directive No. 9240.0-2B Extending the Tracking of Analytical Services to PRP-Lead Superfund Sites. Field personnel will be available for U.S. EPA QA/QC training and orientation where applicable.

The Respondents will demonstrate, in advance, to U.S. EPA's satisfaction, that each laboratory they may use is qualified to conduct the proposed work. This includes use of methods and analytical protocols for the chemicals of concern in the media of interest within detection and quantification limits consistent with both QA/QC procedures and DQOs approved in the QAPP for the Site by U.S. EPA. The laboratory will have and follow an approved QA program. If a laboratory not in the Contract Laboratory Program (CLP) is selected, methods consistent with CLP methods that would be used at this Site for the purposes proposed and QA/QC procedures approved by

U.S. EPA will be used. The Respondents will only use laboratories which have a documented Quality Assurance Program which complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs," (American National Standard, January 5, 1995) and "EPA Requirements for Quality Management Plans (QA/R-2) (EPA/240B-01-002. March 2001) or equivalent documentation as determined by EPA. If the laboratory is not in the CLP program, a laboratory QA program will be submitted for U.S. EPA and Ohio EPA review and U.S. EPA approval. U.S. EPA may require that the Respondents submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on personnel qualifications, equipment and material specifications. The Respondents will provide assurances that U.S. EPA and Ohio EPA have access to laboratory personnel, equipment and records for sample collection, transportation and analysis. Upon request by U.S. EPA, Respondents will allow the U.S. EPA or its authorized representatives to take split and/or duplicate samples of any samples collected by Respondents or their contractors or agents.

Site Health and Safety Plan (2.3.3)

A Health and Safety Plan will be prepared in conformance with the Respondent's health and safety program, and in compliance with the Occupational Safety and Health Administration (OSHA) regulations and protocols outlined in Title 29 of the Code of Federal Regulations (C.F.R.), Part 1910. The Health and Safety Plan will include the 11 elements described in the RI/FS Guidance, such as a health and safety risk analysis, a description of monitoring and personal protective equipment, medical monitoring, and Site control. It should be noted that U.S. EPA does not "approve" the Respondent's Health and Safety Plan, but rather U.S. EPA reviews it to ensure that all necessary elements are included, and that the plan provides for the protection of human health and the environment, and after that review provides comments as may be necessary and appropriate. The safety plan must, at a minimum, follow the U.S. EPA's guidance document Standard Operating Safety Guides, Publication 9285.1-03, PB92-963414, June 1992.

TASK 2 - COMMUNITY RELATIONS (1.6 and 2.3.4)

The development and implementation of community relations activities are the responsibility of U.S. EPA. The critical

community relations planning steps performed by U.S. EPA and Ohio EPA include conducting community interviews and developing a Community Relations Plan. Although implementation of the Community Relations Plan is the responsibility of U.S. EPA, the Respondents may assist by providing information regarding the Site's history, participating in public meetings, by assisting in preparing fact sheets for distribution to the general public, or conducting other activities approved by U.S. EPA. Respondents will prepare baseline human health and ecological risk assessment memoranda which will summarize the toxicity assessment and exposure assessment components of the baseline human health and ecological risk assessment. U.S. EPA will make these memoranda available to all interested parties for comment and place them in the Administrative Record. (U.S. EPA is not required, however, to formally respond to significant comments except during the formal public comment period on the proposed plan after the RI/FS.) The Respondents' community relations responsibilities, will be specified in the Community Relations Plan. All PRP-conducted community relations activities will be planned and developed in coordination with U.S. EPA.

TASK 3 - SITE CHARACTERIZATION (RI/FS Guidance, Chapter 3)

As part of the RI, the Respondents will perform the activities described in this Task including the preparation of a Site characterization summary and a RI/FS report. The RI conducted by Respondents will include an investigation which focuses on the segment of the East Branch of the Black River adjacent to Chemical Recovery Systems, Inc. The overall objective of Site characterization will be to describe areas of the Site that may pose a threat to human health or the environment. This will be accomplished by first determining the Site's physiography, geology, and hydrology. Surface and subsurface pathways of migration will be defined. The Respondents will identify the sources of contamination and define the nature, extent, and volume of the sources of contamination, including their physical and chemical constituents as well as their concentrations at incremental locations to background in the affected media. The Respondents will also investigate the extent of migration of this contamination as well as its volume and any changes in its physical or chemical characteristics, to provide for a comprehensive understanding of the nature and extent of contamination at the Site. Using this

information, contaminant fate and transport will then be determined and projected.

During this phase of the RI/FS, the Work Plan, SAP, and Health and Safety Plan will be implemented. Field data will be collected and analyzed to provide the information required to accomplish the objectives of the study. The Respondents will notify U.S. EPA and Ohio EPA at least two weeks in advance of the field work regarding the planned dates for any field activities including, but not limited to, ecological field surveys, field lay out of the sampling grid, excavation, installation of wells, initiating sampling, installation and calibration of equipment, pump tests, and initiation of analysis and other field investigation activities. The Respondents will demonstrate that the laboratory and type of laboratory analyses that will be utilized during Site characterization meets the specific QA/QC requirements and the DQOs of the Site investigation as specified in the SAP. In view of the unknown conditions associated with the Site, activities may be iterative and, to satisfy the objectives of the RI/FS, it may be necessary for the Respondents to supplement the work specified in the initial Work Plan. In addition to the deliverables below, the Respondents will provide a monthly progress report and participate in meetings at major points in the RI/FS. As work progresses, Respondents may petition the U.S. EPA Project Manager, requesting a less frequent (*i.e.*, quarterly) schedule for progress reports. The Project Manager has discretion to grant such changes in reporting frequency.

a. Field Investigation (3.2)

The field investigation includes the gathering of data to define Site physical and biological characteristics, sources of contamination, and the nature and extent of contamination at the Site. These activities will be performed by the Respondents in accordance with the Work Plan and the SAP. At a minimum, this shall address the following:

Implement and document field support activities (3.2.1)

The Respondents will initiate field support activities following approval of the Work Plan and SAP. Field support activities may include obtaining access to the Site, scheduling, and procuring equipment, office space,

laboratory services, and/or contractors. The Respondents will notify U.S. EPA and Ohio EPA at least two weeks prior to initiating field support activities so that U.S. EPA and Ohio EPA may adequately schedule oversight tasks. The Respondents will also notify U.S. EPA and Ohio EPA in writing upon completion of field support activities.

Investigate and define Site physical and biological characteristics (3.2.2)

The Respondents will collect data on the physical and biological characteristics of the Site and its surrounding areas including the physiography, geology, and hydrology, and specific physical characteristics identified in the work plan. This information will be ascertained through a combination of physical measurements, observations, and sampling efforts and will be utilized to define potential transport pathways and human and ecological receptor populations. In defining the Site's physical characteristics the Respondents will also obtain sufficient engineering data including, but not limited to pumping characteristics for the projection of contaminant fate and transport, and development and screening of remedial action alternatives, including information to assess treatment technologies.

Define sources of contamination (3.2.3)

The Respondents will locate each source of contamination. For each location, the areal extent and depth of contamination will be determined by sampling at incremental depths on a sampling grid, as required by U.S. EPA. The physical characteristics and chemical constituents and their concentrations will be determined for all known and discovered sources of contamination. The Respondents shall conduct sufficient sampling to define the boundaries of the contaminant sources to the level established in the QAPP and the DQOs.

Defining the source of contamination will include analyzing the potential for contaminant release (e.g., long term leaching from soil), contaminant mobility and persistence, and characteristics important for evaluating remedial actions, including information to assess treatment technologies.

Describe the nature and extent of contamination (3.2.4)

The Respondents will gather information to describe the nature and extent of contamination as a final step during the field investigation. To describe the nature and extent of contamination, the Respondents will utilize the information on Site physical and biological characteristics and sources of contamination to give a preliminary estimate of the contaminants that may have migrated. The Respondents will then implement an iterative monitoring program and any study program identified in the Work Plan or SAP such that by using analytical techniques sufficient to detect and quantify the concentration of contaminants, the migration of contaminants through the various media at the Site can be determined. In addition, the Respondents will gather data for calculations of contaminant fate and transport. This process is continued until the area and depth of contamination are known to the level of contamination established in the QAPP and the DQOs. Respondents, U.S. EPA and Ohio EPA will use the information on the nature and extent of contamination to determine the level of risk presented by the Site. Respondents will use this information to help to determine aspects of the appropriate remedial action alternatives to be evaluated.

b. Data Analyses (3.4)

Evaluate Site characteristics (3.4.1)

The Respondents will analyze and evaluate the data to describe: (1) Site physical and biological characteristics, (2) contaminant source characteristics, (3) nature and extent of contamination and (4) contaminant fate and transport. Results of the Site physical characteristics, source characteristics, and extent of contamination analyses are utilized in the analysis of contaminant fate and transport. The evaluation will include the actual and potential magnitude of releases from the sources, and horizontal and vertical spread of contamination as well as mobility and persistence of contaminants. Where modeling is appropriate, such models shall be identified to U.S. EPA and Ohio EPA in a technical memorandum prior to their use. All data and programming, including any proprietary programs, shall be made available to U.S. EPA and Ohio EPA together with a sensitivity analysis. The RI data shall be presented in an Electronic Data Deliverable format (on a computer disc or electronic equivalent). Guidance for preparing and submitting an Electronic Data Deliverable may be found at URL: http://www.epa.gov/region5superfund/edman

The Respondents shall agree to discuss any data gaps identified by the U.S. EPA and then collect any data that is needed to complete the baseline human health and ecological risk assessment. (See "Guidance for Data Useability in Risk Assessment - OSWER Directive # 9285.7-05 - October 1990.) Also, this evaluation shall provide any information relevant to Site characteristics necessary for evaluation of the need for remedial action in the baseline human health and ecological risk assessment and for the development and evaluation of remedial alternatives. Analyses of data collected for Site characterization will meet the DQOs developed in the QAPP stated in the SAP (or revised during the RI).

c. Data Management Procedures (3.5)

The Respondents will consistently document the quality and validity of field and laboratory data compiled during the RI.

Document field activities (3.5.1)

Information gathered during Site characterization will be consistently documented and adequately recorded by the Respondents in well maintained field logs and laboratory reports. The method(s) of documentation will be specified in the Work Plan and/or the SAP. Field logs will be utilized to document observations, measurements, and significant events that have occurred during field activities. Laboratory reports will document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

Maintain sample management and tracking (3.5.2; 3.5.3)

The Respondents will maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only validated analytical data are reported and utilized in the development and evaluation of remedial alternatives. Analytical results developed under the Work Plan will not be included in any Site characterization reports unless accompanied by or cross-referenced to a corresponding QA/QC report. In addition, the Respondents will establish a data security system to safeguard chain-of-custody forms and other project records to prevent loss, damage, or alteration of project documentation.

d. Site Characterization Deliverables (3.7)

The Respondents will prepare the preliminary Site characterization summary. The remedial investigation (RI) report will be prepared concurrently with the feasibility study (FS) report and submitted as a combined RI/FS report.

Preliminary Site Characterization Summary (3.7.2)

After completing field sampling and analysis, the Respondents will prepare a concise Site characterization summary. This summary will review the investigative activities that have taken place, and describe and display Site data documenting the location and characteristics of surface and subsurface features and contamination at the Site including the affected medium, location, types, physical state, concentration of contaminants and quantity. In addition, the location, dimensions, physical condition and varying concentrations of each contaminant throughout each source and the extent of contaminant migration through each of the affected media and natural resources will be documented. The Site characterization summary will provide U.S. EPA and Ohio EPA with a preliminary reference for evaluating the human health and ecological risk assessment, and evaluating the development and screening of remedial alternatives and the refinement and identification of ARARs.

TASK 4 - TREATABILITY STUDIES (RI/FS Manual, Chapter 5)

Based on the information currently available, it is not certain that remediation of the Site will require the performance of treatability studies; however, in the event that U.S. EPA determines that treatability studies are necessary, Respondents shall conduct them as described in this Task 4 of this SOW.

If determined to be necessary by U.S. EPA or the Respondents, treatability testing will be performed by the Respondents to assist in the detailed analysis of alternatives. In addition, if applicable, testing results and operating conditions will be used in the detailed design of the selected remedial technology. The following activities will be performed by the Respondent.

a. Determination of Candidate Technologies and of the Need for Testing (5.2; 5.4)

The Respondents will identify in a technical memorandum, subject to U.S. EPA and Ohio EPA review and U.S. EPA approval, candidate technologies for a treatability studies program as early as project planning (Task 1). The listing of candidate technologies will cover the range of technologies required for alternatives analysis (Task 6 a.) The specific data requirements for the testing program will be determined and refined during Site characterization and the development and screening of remedial alternatives (Tasks 3 and 6, respectively).

Conduct literature survey and determine the need for treatability testing (5.2)

The Respondents will conduct a literature survey to gather information on performance, relative costs, applicability, removal efficiencies, operation and maintenance (O&M) requirements, and implementability of candidate technologies. If practical candidate technologies have not been sufficiently demonstrated, or cannot be adequately evaluated for this Site on the basis of available information, treatability testing will be conducted. Where it is determined by U.S. EPA that treatability testing is required, and unless the Respondents can demonstrate to U.S. EPA's satisfaction that they are not needed, the Respondents will submit a statement of work to U.S. EPA and Ohio EPA outlining the steps and data necessary to evaluate and initiate the treatability testing program.

Evaluate treatability studies (5.4)

Once a decision has been made to perform treatability studies, U.S. EPA will decide on the type of treatability testing to use (e.g., bench versus pilot). Because of the time required to design, fabricate, and install pilot scale equipment as well as perform testing for various operating conditions, the decision to perform pilot testing will be made as early in the process as possible to minimize potential delays of the FS. To assure that a treatability testing program is completed on time, and with accurate results, the Respondents will either submit a separate treatability testing Work Plan or an amendment to the original Site Work Plan for U.S. EPA and Ohio EPA review and U.S. EPA approval.

b. Treatability Testing and Deliverables (5.5; 5.6; 5.8)

The deliverables that are required, in addition to the memorandum identifying candidate technologies, where treatability testing is conducted include a Work Plan, a sampling and analysis plan, and a final treatability evaluation report. U.S. EPA may also require a treatability study health and safety plan, where appropriate.

Treatability testing Work Plan (5.5)

The Respondents will prepare a treatability testing Work Plan or amendment to the original Site Work Plan for U.S. EPA and Ohio EPA review and U.S. EPA approval describing the Site background, remedial technology(ies) to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. The DQOs for treatability testing will be documented as well. If pilot scale treatability testing is to be performed, the pilot-scale Work Plan will describe pilot plant installation and start-up, pilot plant operation and maintenance procedures, operating conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed health and safety plan. If testing is to be performed off-Site, permitting requirements will be addressed.

Treatability study SAP (5.5)

If the original QAPP or FSP is not adequate for defining the activities to be performed during the treatability tests, a separate treatability study SAP or amendment to the original Site SAP will be prepared by the Respondents for U.S. EPA and Ohio EPA review and U.S. EPA approval. Task 1, Item c. of this SOW provides additional information on the requirements of the SAP.

Treatability study health and safety plan (5.5)

If the original Health and Safety Plan is not adequate for defining the activities to be performed during the treatment tests, a separate or amended health and safety plan will be developed by the Respondent. Task 1, Item c. of this SOW provides additional information on the requirements of the Health and Safety Plan. U.S. EPA and Ohio EPA do not "approve" the treatability study health and safety plan.

Treatability study evaluation report (5.6)

Following completion of treatability testing, the Respondents will analyze and interpret the testing results in a technical report to U.S. EPA and Ohio EPA. Depending on the sequence of activities, this report may be a part of the RI/FS report or a separate deliverable. The report will evaluate each technology's effectiveness, implementability, cost and actual results as compared with predicted results. The report will also evaluate full scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

TASK 5 - DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES (RI/FS Manual, Chapter 4)

The development and screening of remedial alternatives will be performed to develop an appropriate range of waste management options that will be evaluated. This range of alternatives will include, as appropriate, options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. The following activities will be performed by the Respondents as a function of the development and screening of remedial alternatives.

a. Development and Screening of Remedial Alternatives (4.2)

The Respondents will begin to develop and evaluate a range of appropriate waste management options that at a minimum ensure protection of human health and the environment.

Refine and document remedial action objectives (4.2.1)

Based on the baseline human health and ecological risk assessment, the Respondents will review and if necessary modify the Site-specific remedial action objectives, specifically the PRGs, that were established by U.S. EPA prior to or during negotiations between U.S. EPA and the Respondents. The revised PRGs will be documented in a technical memorandum that will be reviewed by U.S. EPA and Ohio EPA and approved by U.S. EPA. These modified PRGs will specify the constituents of concern and media of interest, exposure pathways and receptors, and an acceptable contaminant level or range of levels (at particular locations for each exposure route).

Develop general response actions (4.2.2)

The Respondents will develop general response actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the remedial action objectives.

Identify areas or volumes of media (4.2.3)

The Respondents will identify areas or volumes of media to which general response actions may apply, taking into account requirements for protectiveness as identified in the remedial action objectives. The chemical and physical characterization of the Site will also be taken into account.

Identify, screen, and document remedial technologies (4.2.4; 4.2.5)

The Respondents will identify and evaluate technologies applicable to each general response action to eliminate those that cannot be implemented at the Site. General response actions will be refined to specify remedial technology types. Technology process options for each of the technology types will be identified either concurrent with the identification of technology types, or following the screening of the considered technology types. Process options will be evaluated on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative processes for each technology type. The technology types and process options will be summarized for inclusion in a technical memorandum. The reasons for eliminating alternatives will be specified.

Assemble and document alternatives (4.2.6)

The Respondents will assemble selected representative technologies into alternatives for each affected medium or operable unit. Together, all of the alternatives will represent a range of treatment and containment combinations that will address either the Site or the operable unit as a whole. A summary of the assembled alternatives and their related action-specific ARARs will be prepared by the Respondents for inclusion in a technical memorandum. The reasons for eliminating alternatives during the preliminary screening process will be specified.

Refine alternatives

The Respondents will refine the remedial alternatives to identify contaminant volume addressed by the proposed process and sizing of critical unit operations as necessary. Sufficient information will be collected for an adequate comparison of alternatives. PRGs for each chemical in each medium will also be modified as necessary to incorporate any new human health and ecological risk assessment information presented in Respondents' baseline human health and ecological risk assessment report. Additionally, action-specific ARARs will be updated as the remedial alternatives are refined.

Conduct and document screening evaluation of each alternative (4.3)

The Respondents may perform a final screening process based on short and long term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives will be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis. As appropriate, the screening will preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives will include options that use treatment technologies and permanent solutions to the maximum extent practicable. The Respondents will prepare a technical memorandum summarizing the results and reasoning employed in screening, arraying alternatives that remain after screening, and identifying the action-specific ARARs for the alternatives that remain after screening.

b. Alternatives Development and Screening Deliverables (4.5)

The Respondents will prepare a technical memorandum summarizing the work performed in and the results of each task above, including an alternatives array summary. These will be modified by the Respondents if required by U.S. EPA's comments to assure identification of a complete and appropriate range of viable alternatives to be considered in the detailed analysis. This deliverable will document the methods, rationale, and results of the alternatives screening process.

TASK 6 - DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES (RI/FS Guidance, Chapter 6)

The detailed analysis will be conducted by the Respondents to provide U.S. EPA with the information needed to allow for U.S. EPA's selection of a Site remedy. This analysis is the final task to be performed by the Respondents during the FS.

a. Detailed Analysis of Alternatives (6.2)

The Respondents will conduct a detailed analysis of alternatives which will consist of an analysis of each option against a set of nine evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

Apply nine criteria and document analysis (6.2.1 - 6.2.4)

The Respondents will apply nine evaluation criteria to the assembled remedial alternatives to ensure that the selected remedial alternative will be protective of human health and the environment; will be in compliance with, or include a waiver of, ARARs; will be cost-effective; will utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable; and will address the statutory preference for treatment as a principal element. The evaluation criteria include: (1) overall protection of human health and the environment; (2) compliance with ARARs; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, or volume; (5) short-term effectiveness; (6) implementability; (7) cost; (8) state (or support agency) acceptance; and (9) community acceptance. (Note: criteria 8 and 9 are considered after the RI/FS report has been released to the general public.) For each alternative the Respondents will provide: (1) a description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative, and (2) a discussion of the individual criterion assessment. If the Respondents do not have direct input on criteria (8) state (or support agency) acceptance and (9) community acceptance, these will be addressed by U.S. EPA.

Compare alternatives against each other and document the comparison of alternatives (6.2.5; 6.2.6)

The Respondents will perform a comparative analysis between

the remedial alternatives. That is, each alternative will be compared against the others using the evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative are decisions which will be made by U.S. EPA. The Respondents will prepare a technical memorandum summarizing the results of the comparative analysis.

b. Detailed Analysis Deliverables (6.5)

In addition to the technical memorandum summarizing the results of the comparative analysis, the Respondents will submit a draft RI/FS report to U.S. EPA and Ohio EPA for review and U.S. EPA approval.

Remedial Investigation and Feasibility study report (3.7.3 and 6.5)

The Respondents will prepare a draft RI/FS report for U.S. EPA and Ohio EPA review and U.S. EPA approval. This report shall summarize results of field activities to characterize the Site, sources of contamination, nature and extent of contamination, the fate and transport of contaminants, nature and extent of injury to natural resources, the analysis of remedial alternatives. This report will include the methodology and results of the baseline human health and ecological risk assessment if deemed appropriate by U.S. EPA. The Respondents will refer to the RI/FS Guidance for an outline of the report format and contents. Following comment by U.S. EPA, the Respondents will prepare a final RI/FS report which satisfactorily addresses U.S. EPA's comments.

This report, as ultimately adopted or amended by U.S. EPA, provides a basis for remedy selection by U.S. EPA and documents the development and analysis of remedial alternatives. The Respondents will refer to the RI/FS Guidance for an outline of the report format and the required report content.

REFERENCES FOR CITATION

The following list, although not comprehensive, comprises many of the regulations and guidance documents that apply to the RI/FS process:

The (revised) National Contingency Plan;

"Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01;

"Interim Guidance on Potentially Responsible Party Participation in Remedial Investigation and Feasibility Studies," U.S. EPA, Volume I Office of Waste Programs Enforcement, July 1, 1991, OSWER Directive No. 9835.1(c);

"Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies," Volume II U.S. EPA, Office of Waste Programs Enforcement, July 1, 1991 OSWER Directive No. 9835.1(d);

"A Compendium of Superfund Field Operations Methods," Two Volumes, U.S. EPA,.Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

"Guidance for the Data Quality Objectives Process (QA-G-4)," (EPA/600/R-96/055, August 2000).

"Guidance for the Data Quality Objectives Process for Hazardous Waste Sites (QA/G-4HW)," (EPA/600/R-00/007, January 2000).

"Guidance for the Preparation of Standard Operating Procedures (QA-G-6)" (EPA/240/B-01/004, March 2001).

"EPA Requirements for Quality Management Plans (QA/R-2)," (EPA/240/B-01/002, March 2001).

"EPA Requirements for Quality Management Plans (QA/R-2)," (EPA/240/B-01/003, March 2001).

"Guidance for Quality Assurance Project Plans,(QA/G-5)" (EPA/600/R-98/018, February 1998).

"Users Guide to the EPA Contract Laboratory Program," U.S. EPA, Sample Management Office, January 1991, OSWER Directive No. 9240.0-01D.

"CERCLA Compliance with Other Laws Manual," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (draft), OSWER Directive No. 9234.1-01 and -02.

"Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," U.S. EPA, Office of Emergency and Remedial Response, (draft), OSWER Directive No. 9283.1-2.

"Draft Guidance on Preparing Superfund Decision Documents," U.S. EPA, Office of Emergency and Remedial Response, March 1988, OSWER Directive No. 9355.3-02

"Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual (Part A)," December 1989, EPA/540/1-89/002

"Ecological Risk Assessment Guidance for Superfund: Process for Designing & Conducting Ecological Risk Assessments," U.S. EPA, OSWER Directive, No. 9285.7-25, February 1997.

"Guidance for Data Useability in Risk Assessment," October, 1990, EPA/540/G-90/008

"Performance of Risk Assessments in Remedial Investigation /Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)," August 28, 1990, OSWER Directive No. 9835.15.

"Supplemental Guidance on Performing Risk Assessments in Remedial Investigation Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)," July 2, 1991, OSWER Directive No. 9835.15(a).

"Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," April 22, 1991, OSWER Directive No. 9355.0-30.

Risk Assessment Guidance for Superfund: Volume I, Human Health Evaluation Manual (Part D, Standardized Planning, Reporting and Review of Superfund Risk Assessments) Publication 9285.7-47, September 2001.

"Health and Safety Requirements of Employees Employed in Field Activities," U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order No. 1440.2.

OSHA Regulations in 29 CFR 1910.120 (Federal Register 45654, December 19, 1986).

"Standard Operating Safety Guides" (PB92-963414, June, 1992)

"Interim Guidance on Administrative Records for Selection of CERCLA Response Actions," U.S. EPA, Office of Waste Programs Enforcement, March 1, 1989, OSWER Directive No. 9833.3A.

"Community Relations in Superfund: A Handbook," U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9230.0#3B. January 1992, OSWER Directive No. 9230.0-3C.

"Community Relations During Enforcement Activities And Development of the Administrative Record," U.S. EPA, Office of Programs Enforcement, November 1988, OSWER Directive No. 9836.0-1A.